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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/878,123	06/08/2001	Takashi Kumamoto	10559-445001/ P9482X	2371

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EXAMINER

THAI, LUAN C

ART UNIT PAPER NUMBER

2827

DATE MAILED: 08/30/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/878,123

Applicant(s)

KUMAMOTO ET AL.

Examiner

Luan Thai

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 13-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restriction***

Applicant's election without traverse of group I, claims **1-12** in Paper No. 9 filed May 22, 2002 is acknowledged.

***Title***

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

***Information Disclosure Statement***

2. The information disclosure statement (IDS) filed on 8/13/01 has been considered by the examiner.

***Drawings***

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the features of "the conductive substrate comprises etches that are filled with a *resistive composition*" in claim 7 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim 7 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification, as originally filed, does not disclose the conductive substrate comprising *etches that are filled with a resistive composition* as recited in claim 7.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 7, the recitation of "the conductive substrate comprising *etches that are filled with a resistive composition*" is unclear as to whether "a resistive composition" and "a polymer composition" (recited in claim 6) imply the same composition or different. Note that applicant's figures 4A-4D show the polymer composition 150 being the only material formed the network and filled the half etches 710.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

9. Claims 1-4 are rejected under 35 U.S.C. 102(e) as being anticipated by Glenn (6,150,193).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 1-4, Glenn (see specifically figures 2-4-6) a device comprising: a lead frame having conductive leads 22 and an insulative composition, which is a portion of insulative material 37, interposed between the leads 22; a die 30 having a lower die surface that is connected by solder bumps to the leads, and is spaced by a gap from a first region of the lead frame; and a polymer composition 42 that forms a continuous network that layer extending above the lower die surface to cover the upper die surface and regions of the lead frame surface that are outside the first region and not occupied by any component. Glenn further discloses an insulative layer 37 partially filling the gap and covering the first region.

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn (6,150,193) in view of Hayashida et al. (6,060,768).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claim 5, the device of Glenn discloses all the limitations of the claimed invention as detailed above except for the pitch of the leads (e.g., less than 0.10 mm).

The pitch of the leads being less than 0.1 mm, however, is conventional in the art as taught by Hayashida et al. (Col. 12, lines 13+). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the leads in Glenn's device to have the pitch being less than 0.1 mm, as taught by Hayashida et al, for the purpose of improving the density of the leads in a device package.

12. Claims 6-9, insofar as in compliance with 35 USC § 112, are rejected under 35 U.S.C. 103(a) as being unpatentable over Azuma (U.S. Patent Application Publication No. 2001/0009301) in view of Wang et al. (6,000,924).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 6-9, Azuma (see specifically figures 14-26) a conductive substrate 101 comprising half etches 131 (figure 16B) filed with a resistive composition 113; a die 107b having a lower die surface that is connected by contacts (e.g., solder balls 119) to the substrate, and is spaced by a gap from the substrate; a sealing resin 113b that forms a network on a region of the substrate that extends above the lower die surface, the layer imparting sufficient rigidity to the device to maintain integrity of the contacts during etching of the substrate in the absence of a supporting frame (see figures 16-18). Azuma does not specifically teach the sealing resin to be a polymer.

Polymer, however, is conventional in semiconductor art for being an encapsulant or a sealing resin as disclosed by Wang et al (Col. 5, lines 50+). It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the sealing resin made of a polymer composition to Azuma's device package, since polymer is a well-known material in art for sealing a semiconductor device on a substrate, as taught by Wang et al.

13. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juskey et al (6,356,453) in view of Wang et al. (6,000,924).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 10-12, Juskey et al (see specifically figures 5-9) a device comprising: a lead frame having plurality of leads 514-515; a die 522 having a lower surface that is connected by contacts (e.g., solder bumps 548) to, and is spaced by a gap from a first region of the leads; a peripheral component 532 also connected to the leads at a location other than in the first region; an insulative layer partially filling the gap and covering the first region; a sealing composition extending in a direction normal to the lead frame at least above the lower die surface and extending along a surface of the lead frame from the die to the peripheral component 532. Juskey et al do not specifically teach the sealing composition being a polymer.

Polymer, however, is conventional in semiconductor art for being an encapsulant or a sealing resin as disclosed by Wang et al (Col. 5, lines 50+). It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the sealing resin made of a polymer composition to Juskey et al's device package, since polymer is a well-known material in art for sealing a semiconductor device on a substrate, as taught by Wang et al.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan Thai whose telephone number is (703) 308-1211. The examiner can normally be reached on 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (703) 305-9883. The fax phone



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numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Luan Thai  
August 28, 2002



DAVID L. TALBOTT  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800